

REMARKS

Claims 1-36 are pending in this application. Claims 1, 18, 19, 21-23 and 27-34 have been amended and new claims 35 and 36 have been added to correct certain editorial errors and to clarify the present invention.

In claim 1, step (c) is amended to recite “heating the decorated vitreous article at a temperature.” Likewise, in claim 21, step (i) is amended to recite “heating the glass substrate at a first temperature.” Support for amended claims 1 and 21 can be found in the specification at, *inter alia*, page 18, lines 3-5. Claims 22 and 27-34 have been amended in view of amended claims 1 and 21. Specifically, claim 22 has been amended to distinguish the first temperature used for heating the glass substrate from the second temperature used for contacting the decorative indicia with the aqueous alkaline solution, and claims 27-34 have been amended so they no longer recite the term “elevated.” The term “ink” has been replaced with the term “ink composition” in claims 1, 18 and 19. The term “radiation cured” has been replaced with the term “radiation curable” in claims 21 and 23. Claim 29 has been amended to recite heating the decorated vitreous article at a temperature that is greater than 90°C and “is sufficient to cure and fuse the ink composition to the vitreous article.” Claim 32 has been amended to recite heating the glass substrate at a temperature that is greater than 90°C and “is sufficient to cure and fuse the ink composition to the glass substrate.” Support for amended claims 29 and 32 can be found in the specification at, *inter alia*, page 18, lines 3-5. New dependent claims 35 and 36 have been added to recite heating the decorated vitreous article or glass substrate at 100°C to 200°C. Support for new claims 35 and 36 can be found in the specification at, *inter alia*, page 18, line 7. These amendments do not raise new issues or add new matters.

Reconsideration of the present application and allowance of the present application in view of the above amendments and following remarks are respectfully requested.

I. THE REJECTION OF CLAIMS 1-28, 31 AND 34 UNDER 35 U.S.C. § 112, FIRST PARAGRAPH, SHOULD BE WITHDRAWN

The Examiner rejected claims 1-28, 31 and 34 under 35 U.S.C. § 112, first paragraph, alleging that the specification does not enable any person skilled in the art to make and use the invention commensurate in scope with these claims. Specifically, the Examiner alleges that the specification, while being enabling for elevated temperatures of 90-200°C or 100-200°C, does not reasonably provide enablement for any elevated temperature. The Examiner acknowledges that while there is written description support for the recitation of “elevated

temperature” (see Office Action, page 5, lines 11-14), the Examiner alleges that undue experimentation would be needed to make and use the claimed invention given that the claims read on any elevated temperature and given that there is no direction or guidance presented in the specification for subjecting the decorated vitreous article to any elevated temperature.

Applicants respectfully assert that for the following reasons, the instant specification does indeed fully enable one of skill in the art to practice the claimed invention.

1. The Legal Standard

The enablement requirement refers to the requirement of 35 U.S.C. § 112, first paragraph, that the specification describes (1) how to make and (2) how to use the invention. *See* MPEP § 2164. The test for enablement is whether one reasonably skilled in the art could make or use the invention, without undue experimentation, from the disclosure in the patent specification coupled with information known in the art at the time the patent application was filed. *United States v. Telectronics Inc.*, 857 F.2d 778, 8 USPQ2d 1217 (Fed. Cir. 1988). Enablement is not precluded even if some experimentation is necessary. The fact that experimentation may be complex does not necessarily make it undue, if the art typically engages in such experimentation. *In re Certain Limited-Charge Cell Culture Microcarriers*, 221 USPQ 1165, 1174 (Int’l Trade Comm’n 1983).

By definition, undue experimentation is experimentation that would require a level of ingenuity beyond what is expected from one of ordinary skill in the field. *Fields v. Conover*, 170 U.S.P.Q. 276, 279 (CCPA 1971). The factors that are relevant in determining what constitutes undue experimentation as set forth in *Wands* (citing *Ex parte Forman*, 230 USPQ 546, 547 (Bd. Pat. App. & Int. 1986)) include: “(1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.” Any conclusion of nonenablement must be based on the evidence as a whole, and not based on an analysis of only one of the factors while ignoring one or more of the others. *In re Wands*, 858 F.2d 731, 740, 8 USPQ2d 1400, 1406 (Fed. Cir. 1988).

The PTO must establish a *prima facie* case of non-enablement in order to properly reject a claim on that basis. “When rejecting a claim under the enablement requirement of § 112, the PTO bears an initial burden of setting forth a reasonable explanation as to why it believes that the scope of protection provided by that claim is not adequately enabled by the

description of the invention in the specification of the application...” *In re Wright*, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). The PTO’s *prima facie* case should address each of the *Wands* factors since “[i]t is improper to conclude that a disclosure is not enabling based on an analysis of only one of the [*Wands*] factors while ignoring one or more of the others.” See MPEP § 2164.01(a), citing *Wands* at 1407. Where the PTO does not provide evidence regarding one or more *Wands* factors, Applicants presume that such factors support the conclusion that the claims at issue are fully enabled.

2. The Present Invention

The present invention is based in part on the discovery of a novel method of decorating vitreous articles with radiation curable ink composition comprising free acid groups (claim 1) and the complete and efficient stripping of the decorative indicia from the decorated vitreous article (*e.g.*, a glass substrate) with an alkali (claim 21).

Claim 1 is directed to a method for decorating a vitreous article that includes, *inter alia*, “heating the decorated vitreous article at a temperature *until the ink composition is cured and fused on the vitreous article.*” Claims 2-20, 27, and 29-31 depend from claim 1 and, thus, also include the limitations of claim 1. Claim 21 is directed to a method for stripping decorative indicia from a glass substrate decorated with a radiation curable ink composition that is “operable after . . . heating the glass substrate at a first temperature *to cure and fuse the ink composition on the glass substrate.*” Claims 22-26, 28 and 32-34 depend from claim 21 and, thus, also include the limitations of claim 21. The decorated vitreous article and glass substrate are subject to “an application of heat to finally polymerize the ink on the substrate.” Specification, page 18, lines 3-7; Example 7. Thus, the vitreous article and glass substrate are heated until the ink composition is cured and fused (or finally polymerized) on the vitreous article or glass substrate.

3. The Specification Fully Enables The Methods Of Claims 1-28, 31 and 34

The instant specification fully enables one of skill in the art to make and use the invention commensurate in scope with the claims without undue experimentation as explained below. In particular, Applicants submit that one skilled in the art can make and use the invention including heating the vitreous article at a temperature to cure and fuse the ink composition to a vitreous article or glass substrate, without undue experimentation, by using the teaching from the specification *coupled with* information known in the field of decorating vitreous articles with radiation curable ink composition.

The Examiner applied three *Wand* factors under the test for undue experimentation. First, the Examiner alleges that the quantity of experimentation necessary is great since claims 1-28, 31 and 34 read on any elevated temperature such as 30°C, 40°C, 80°C, 300°C, 400°C etc. However, the Examiner does acknowledge that the specification is enabling for elevated temperatures of 90-200°C or 100-200°C.

Applicants point out that the Examiner has not made an enablement rejection over the method *as a whole*. “The invention that one skilled in the art must be enabled to make and use is *that defined by the claim(s)* of the particular application or patent.” See MPEP § 2164 (emphasis added). The present claims require heating the vitreous article at a temperature until the ink composition is cured and fused on the vitreous article (claim 1) or heating the glass substrate at a first temperature to cure and fuse the ink composition on the glass substrate (claim 21). Thus, the vitreous article is not heated at any elevated temperature as the Examiner alleges, but a temperature *that will cure and fuse the ink composition to the vitreous article or glass substrate, i.e.,* a temperature that will finally polymerize the ink composition on the vitreous article or glass substrate.

Contrary to the Examiner’s allegation, although some experimentation might be necessary to practice the presently claimed invention, the quantity of experimentation is not unduly burdensome to one of skill in the art. In fact, Applicants submit that the claims only read on those temperatures or range of temperatures that would allow the ink composition to fully bond to the vitreous article, and would exclude, for example, temperatures that damage the cured ink composition or the decorated article.

Attention is respectfully directed to page 18, lines 3-5 of the specification, which states that “[i]n *some* cases it may be necessary to subject the newly screened glass container to . . . an additional post-UV cure application of heat to finally polymerize the ink composition on the substrate.” Applicants submit that it would be routine experimentation for one of ordinary skill in the relevant art to determine the range of temperatures to which the ink composition may be exposed to, subsequent to UV curing, particularly given the teachings of the specification. In other words, to finally polymerize on the substrate is neither indefinite nor overly broad as to require undue experimentation to determine. In particular, Applicants submit that one of ordinary skill in the relevant art would know the range of temperatures that the decorated vitreous article should be heated at, *i.e.,* a temperature that can cure and fuse the ink composition to the substrate and is not detrimental and possibly destructive to the cured ink composition that is present on the decorated article. Applicants also submit that one skilled in the art would know for how long the decorated

vitreous article needs to be heated at such temperature, *i.e.*, until the ink composition is cured and fused to the vitreous article.

Applicants submit that the application of heat to finally polymerize the ink composition onto the vitreous article is a simple and straightforward process as known to one skilled in the art. Moreover, the skilled artisan in the art of radiation-curing technology would certainly realize that exposure of the decorated vitreous article to abnormally high temperatures or temperatures incompatible with the ink composition or glass articles after UV-curing could be detrimental and possibly destructive to the cured ink composition that is present on the decorated article. The approximate temperature that would be damaging to the post-UV cured ink composition can be determined by simple trial and error and would be somewhat intuitive to one of ordinary skill in the relevant art and as such, a finite and almost universally recognized range of temperatures as recited in presently pending claims 1 and 21 need not be provided in the instant claims or specification in order to meet the enablement requirement.

In response to the argument made by Applicants in the Reply to Office Action Under 37 C.F.R. § 1.111 filed on July 28, 2003 that one of ordinary skill in the art would be able to determine an upper limit of the elevated temperature range given that very high temperatures could be detrimental and possibly destructive to the cured ink composition on the decorated article, the Examiner alleges that undue experimentation would still be necessary to determine exactly what this “very high” temperature is given that the present claims currently read on any elevated temperature (see Office Action, page 5, line 18 to page 6, line 1). However, Applicants respectfully disagree.

As discussed above, although routine experimentation might be necessary to practice the present invention, *e.g.*, heating the decorated vitreous article at different temperatures, and determining when the ink composition is cured and fused on the vitreous article, Applicants submit that no undue experimentation is required to practice the presently claimed method.

Enablement is not precluded even if *some* experimentation is necessary, although the amount of experimentation needed must not be unduly extensive. *Atlas Powder Co. v. E.I. Du Pont De Nemours & Co.*, 750 F.2d 1569, 1576, 224 USPQ 409, 413 (Fed. Cir. 1984); *W.L. Gore and Associates v. Garlock, Inc.*, 721 F.2d 1540, 1556, 220 USPQ 303, 315 (Fed. Cir. 1983). Nothing more than objective enablement is required, and therefore it is irrelevant whether this teaching is provided through broad terminology or illustrative examples. *In re Marzocchi*, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971).

Applicants submit that based on the teachings of the specification and information known in the field of radiation-curing technology, one skilled in the art would know how to heat a decorated vitreous article (*e.g.*, glass) at different temperatures and determine when an ink composition is cured and fused on the vitreous article. It would be well within the abilities of the skilled artisan to be able to apply and monitor such a post-UV cure application of heat in order to determine a useful temperature range and time of exposure to a temperature that would be sufficient to fully bond the ink composition to the vitreous article. Thus, contrary to the Examiner's allegation, although the heating step in the claimed method might require *some* experimentation, it does not require *undue* experimentation.

Second, the Examiner alleges that there is no direction or guidance presented for subjecting the decorated vitreous article to any elevated temperature.

The specification provides full and clear support for how to make the radiation curable ink composition, how to apply and cure the radiation curable ink composition onto a vitreous article, and how to heat the decorated vitreous article until the radiation curable ink composition is cured and fused on the vitreous article. The specification teaches each step and the components used in each step of the decorating method. Preferred radiation curable ink compositions are taught in the specification at, *e.g.*, page 3, lines 11-15; page 4, line 20 to page 17, line 4; and Examples 1-6. Preferred decorating steps are taught in the specification at, *e.g.*, page 17, lines 12-14 (applying a radiation curable ink composition to a vitreous article); page 17, line 14 to page 18, line 3 (curing the ink composition on the vitreous article); and page 18, lines 3-7 (heating the decorated vitreous article until the ink composition is cured and fused on the vitreous article). Moreover, the specification teaches an illustrative example on how to apply a radiation curable ink composition to a vitreous article, cure the ink composition on the vitreous article, and heat the decorated vitreous article until the ink composition is cured and fused on the vitreous article (see Example 7). Further, the specification teaches a range of temperature under which the decorated vitreous article may be heated (*e.g.*, 90-200°C).

With regard to the Examiner's narrow reading of the instant specification in connection with a post-UV cure application of heat, Applicants point out that the temperatures provided at page 18, lines 6-7 of the specification clearly relate to *preferred embodiments* of the present invention for the temperatures that may be utilized during such a post-UV cure exposure to heat. As stated: "*Preferably*, the decorated substrate is subjected to post-UV cure heating at a temperature of 90 to 200°C, *preferably* 100-200°C, for a period of

0.5 to 30 minutes.” This language clearly indicates that these temperature and time ranges are not to be construed as limiting embodiments.

As long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement of 35 U.S.C. § 112 is satisfied. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970) (emphasis added). Here, the specification not only teaches that the decorated vitreous article can be heated at a temperature so that the ink composition becomes fully bonded to the vitreous article, but it also teaches a range of temperature as well as a specific working example. In addition, the specification discloses that the heating step is only necessary *until* the ink composition is finally polymerized on the vitreous article. Based on the generous amount of directions and guidance presented in the specification, Applicants submit that the quantity of experimentation necessary is not undue.

Thus, Applicants submit that one skilled in the art can make and use the invention including heating the vitreous article to a temperature to cure and fuse the ink composition to the substrate, without undue experimentation, by using the teachings from the specification *coupled with* information known in the field.

Third, the Examiner alleges that there is an absence of working examples concerning subjecting the decorated vitreous article to any elevated temperature.

The specification need not contain an example if the invention is otherwise disclosed in such manner that one skilled in the art will be able to practice it without an undue amount of experimentation. *In re Borkowski*, 422 F.2d 904, 908, 164 USPQ 642, 645 (CCPA 1970). Nevertheless, contrary to the Examiner’s allegation, the specification does provide a non-limiting example on heating a vitreous article at a temperature of 100°C (see Example 7). In addition, as discussed above, one skilled in the art will be able to practice the present invention without an undue amount of experimentation.

Further, any conclusion of nonenablement must be based on the evidence as a whole, and not based on an analysis of only one of the factors while ignoring one or more of the others. *In re Wands*, 858 F.2d at 740, 8 USPQ2d at 1407. Applicants submit that the Examiner erred by limiting the scope of the claims to the examples provided in the specification. The absence of an illustrative examples is not determinant on whether undue experimentation is required. *In re Marzocchi*, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971).

Applicants submit that when all of the *Wand* factors are considered, one of ordinary skill in the art can determine without undue experimentation those temperatures or ranges of

temperature that would be sufficient to cure and fuse the ink composition to the vitreous article or glass substrate. These *Wand* factors are as follows: First, the quantity of experimentation necessary is routine and not unduly extensive. Second, the amount of direction or guidance presented is sufficient. Third, the specification provides a working example of the method of the present invention. Fourth, the state of the art of heating a vitreous article at a temperature and determining when an ink composition is cured and fused on the vitreous article or glass substrate is not high. Fifth, the relative skill of those in the art is high in terms of heating a vitreous article at a temperature and determining when an ink composition is cured and fused on the vitreous article. Sixth, the art of heating a vitreous article at a temperature and determining when an ink composition is fully polymerized to the vitreous article is predictable. Finally, the breadth of the claims is reasonable and not overly broad.

Accordingly, the instant specification fully enables one of skill in the art to make and use the invention commensurate in scope with the claims without undue experimentation. As such, Applicants respectfully request that the rejection of claims 1-28, 31 and 34 under 35 U.S.C. § 112, first paragraph, be withdrawn.

II. THE REJECTION OF CLAIMS 29, 31, 32 AND 34 UNDER 35 U.S.C. § 112, FIRST PARAGRAPH, SHOULD BE WITHDRAWN

Claims 29, 31, 32 and 34 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the specification was filed, had possession of the claimed invention. While the Examiner admits that there is support in the specification for the recitation that the decorated vitreous article is subjected to a temperature of 90 to 200°C and 100 to 200°C, the Examiner alleges that there is no support for the recitation of temperature that is “greater than 90°C” which includes all temperatures above 90°C.

Although Applicants do not agree and in no way acquiesce with this rejection, solely to expedite prosecution, Applicants have amended claim 29 to recite “greater than 90°C and is sufficient to cure and fuse the ink composition to the vitreous article” and claim 32 to recite “greater than 90°C and is sufficient to cure and fuse the ink composition to the glass substrate.” Amended claims 29 and 32 only recite those temperatures that are greater than 90°C and are sufficient to cure and fuse the ink composition to the vitreous article or glass substrate. Applicants submit that the specification fully and clearly describes heating a

vitreous article at a temperature that is greater than 90°C and is sufficient to cure and fuse the ink composition to the vitreous article or glass substrate, *i.e.*, a temperature that will finally polymerize the ink composition on the vitreous article or glass substrate.

The test for sufficiency of written description is whether the disclosure of the application “reasonably conveys to the artisan that the inventor had possession” of the claimed subject matter. *In re Kaslow*, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983); accord *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563; *see also*, *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985). It is clear that the specification need not provide written description support in exactly the same words that are used in the claims. It is enough that the description conveys to the skilled artisan that the applicant had possession of the invention. For example, *see In re Wilder*, 736 F.2d 1516, 1520, 222 USPQ 369, 372 (Fed. Cir. 1984):

It is not necessary that the claimed subject matter be described identically, but the disclosure originally filed must convey to those skilled in the art that applicant has invented the subject matter later claimed.

See also Application of Lukach, 442 F.2d 967, 969, 169 USPQ 795, 796 (C.C.P.A. 1971): “[T]he invention claimed does not have to be described in *ipsis verbis* in order to satisfy the description requirement of 112.” It is not necessary that the application describe the claim limitations exactly, but only so clearly that persons of ordinary skill in the art will recognize from the disclosure that applicants invented the processes including those limitations. *In re Wertheim*, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976). Indeed, not only is it unnecessary to described the claimed invention *ipsis verbis* to satisfy the written description requirement of 35 U.S.C. § 112, but, where a non-essential feature of the claim is concerned, the claim need not be limited to an embodiment exemplified in the specification if one of ordinary skill in the art will recognize that applicants invented the claimed subject matter. *See In re Peters*, 723 F.2d 891 (Fed. Cir. 1983).

Applicants submit that the specification provides, as *preferred embodiments*, a range of temperatures, *i.e.*, 90 to 200°C and 100 to 200°C, that is greater than 90°C and is sufficient to cure and fuse the ink composition to the vitreous article (see page 18, lines 6-7; Example 7). As stated: “*Preferably*, the decorated substrate is subjected to post-UV cure heating at a temperature of 90 to 200°C, *preferably* 100-200°C for a period of 0.5 to 30 minutes.” This language clearly indicates that these temperature and time ranges are not to be construed as limiting embodiments, and as such, Applicants believe that the term “greater than 90°C and is

sufficient to cure and fuse the ink composition to the vitreous article/glass substrate” as recited in currently pending claims 29 and 32 meets the written description requirement as it is: (a) supported in the specification, *e.g.*, at page 18, lines 3-5, which recites: “In some cases it may be necessary to subject the newly screened glass container to . . . an additional post-UV cure application of heat to finally polymerize the ink on the substrate;” and (b) described in the specification in a way that clearly conveys to the skilled artisan that the applicant had possession of the claimed invention.

Applicants submit that amended claims 29 and 32, and dependent claims 31 and 34, are sufficiently described and fully supported by the specification as originally filed (see, *e.g.*, page 18, line 3-7; Example 7). As such, Applicants respectfully request that the rejection of claims 29, 31, 32 and 34, under 35 U.S.C. § 112, first paragraph, be withdrawn.

III. THE REJECTION OF CLAIMS 1-34 UNDER 35 U.S.C. § 112, SECOND PARAGRAPH, SHOULD BE WITHDRAWN

Claims 1-34 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner alleges that the scope of the claims is confusing because it is not clear what is meant by “elevated temperature.” More specifically, the Examiner alleges that it is not clear as to what the “elevated temperature” is elevated to. Further, the Examiner alleges that it is not clear as to what temperatures are encompassed by the phrase “elevated temperature.”

For the following reasons, Applicants do not agree and in no way acquiesce with this rejection. However, solely to expedite prosecution, Applicants have amended claims 1 and 21 to recite heating the decorated vitreous article or the glass substrate “at a temperature.” In particular, claim 1 recites “heating the decorated vitreous article at a temperature *until the ink composition is cured and fused on the vitreous article.*” Claim 21 recites the phrase “heating the glass substrate at a first temperature *to cure and fuse the ink composition on the glass substrate.*” Thus, the temperature is *that which will cure and fuse the ink composition to the vitreous article or glass substrate.*

“[T]he definiteness of the language must be analyzed, not in a vacuum, but always in light of the teachings of the disclosure as it would be interpreted by one of ordinary skill in the art. Applicant’s claims, interpreted in light of the disclosure, must reasonably apprise a person of ordinary skill in the art of the invention.” MPEP § 2106 (V)(A)(2). As discussed above, one of ordinary skill in the art would understand what temperatures or ranges of

temperature would be sufficient to cure and fuse the ink composition on the vitreous article or glass substrate. In addition, in light of the teachings of the present specification as interpreted by one of ordinary skill in the art, it is believed that the present claims are definite.

Thus, in view of the present amendments and above arguments, withdrawal of the rejection of claims 1-34 under 35 U.S.C. § 112, second paragraph, is respectfully requested.

IV. CONCLUSION

In light of the submissions herewith, the above remarks and amendments, it is submitted that all outstanding objections and rejections have been overcome. Attorneys for Applicants respectfully submit that the pending claims fully meet all statutory requirements for patentability. Withdrawal of the rejections and allowance of claims 1-36 are respectfully requested. Should the Examiner not agree with Applicants' position, then a personal or telephonic interview is respectfully requested to discuss any remaining issues and expedite the eventual allowance of the application.

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